

Twin Tunnels Design/Construction Technical Team Meeting #15

**July 25, 2013
9:00AM – 11:00AM**

**CDOT Region 1
Golden, Colorado**



Agenda

1. Introductions
2. Agenda Review
3. Other Corridor Updates
4. Construction update
5. Trailhead and Portal area aesthetics update
6. Environmental Compliance / Adaptive Mitigation
7. CSS Design Phase Process Evaluation
8. Next Steps

Step 1
Define Desired Outcomes
and Actions

Step 2
Endorse the Process

Step 3
Establish Criteria

Step 4
Develop Alternatives and Options

Step 5
Evaluate, Select, and Refine
Alternatives and Options

Step 6
Finalize Documentation and
Evaluation Process



Other Corridor Updates

- AGS Study
- Peak Period Shoulder Lanes
- Traffic and Revenue Study
- Section 106 Programmatic Agreement Trailhead Sign



Example Interpretive Sign

Core Values

- **Safety**
- **Mobility**
- **Gateway**
- **Wildlife**
- **The Creek**
- **Destination**
- **History**
- **Constructability**
- **Inclusivity**
- **Schedule**



Twin Tunnels Schedule

Package 1A

- Complete

Package 1B and 2

- Under Construction

Package 3

- FIR Meeting
May 29, 2013
- **FOR Meeting**
Aug. 28, 2013
- **NTP: Oct. 15, 2013**

Construction Updates

- One of the sign bridges has been installed, others will be in about 1 month
- Tunneling – As of 7/22/13 there is 80' of tunnel excavation to be completed

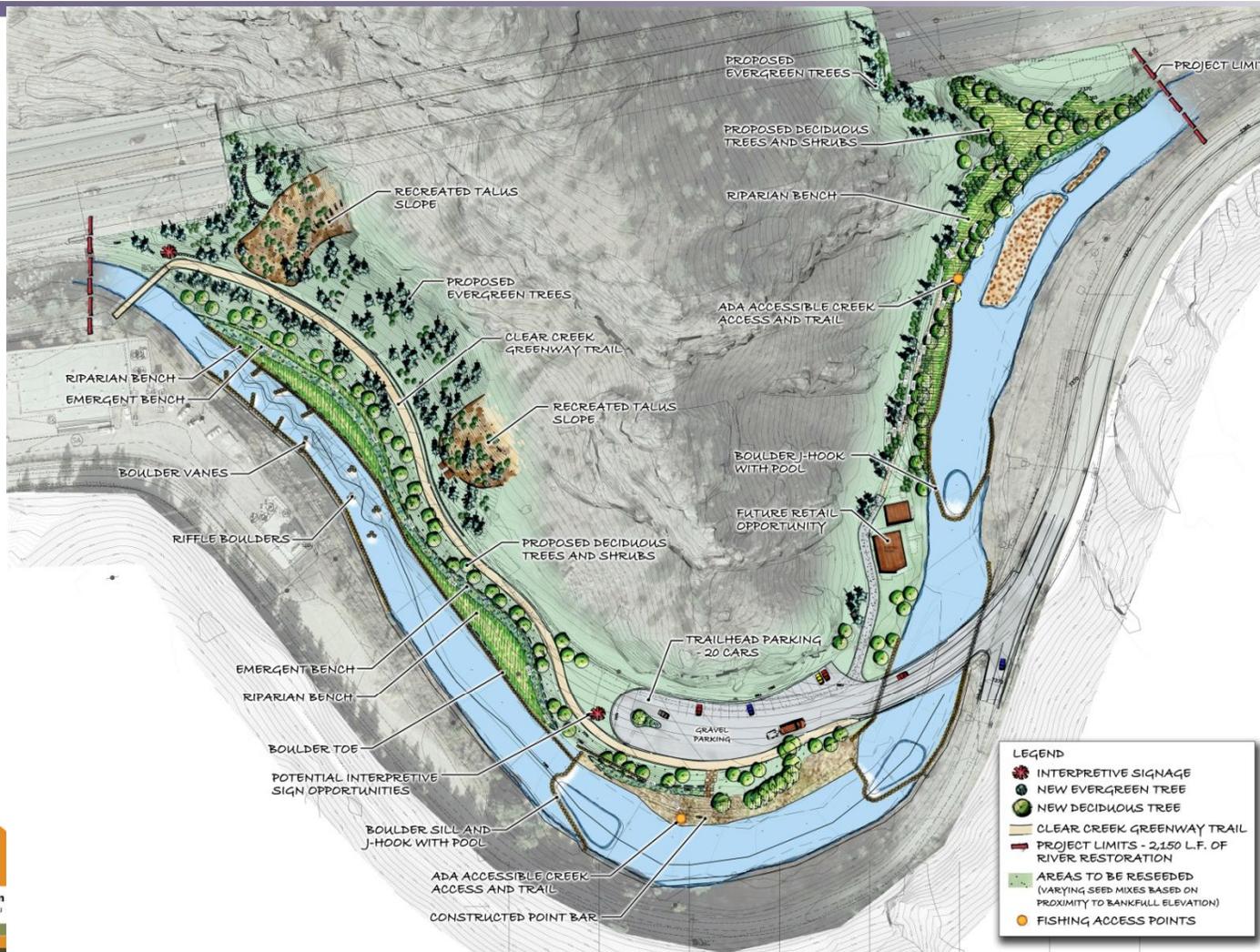


2014 Construction Milestones

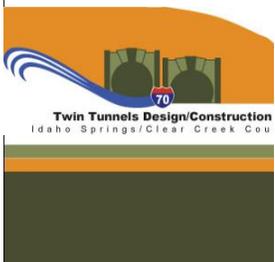
- January 2014 – Clearing and removal of Game Check Area, Removal of temp bridge and box culvert, Utilities
- February – March 2014 – West Portal Grading
- March - April 2014 – Habitat improvements in-stream, East Portal Grading
- May – October 2014 – Stone Fascia Construction

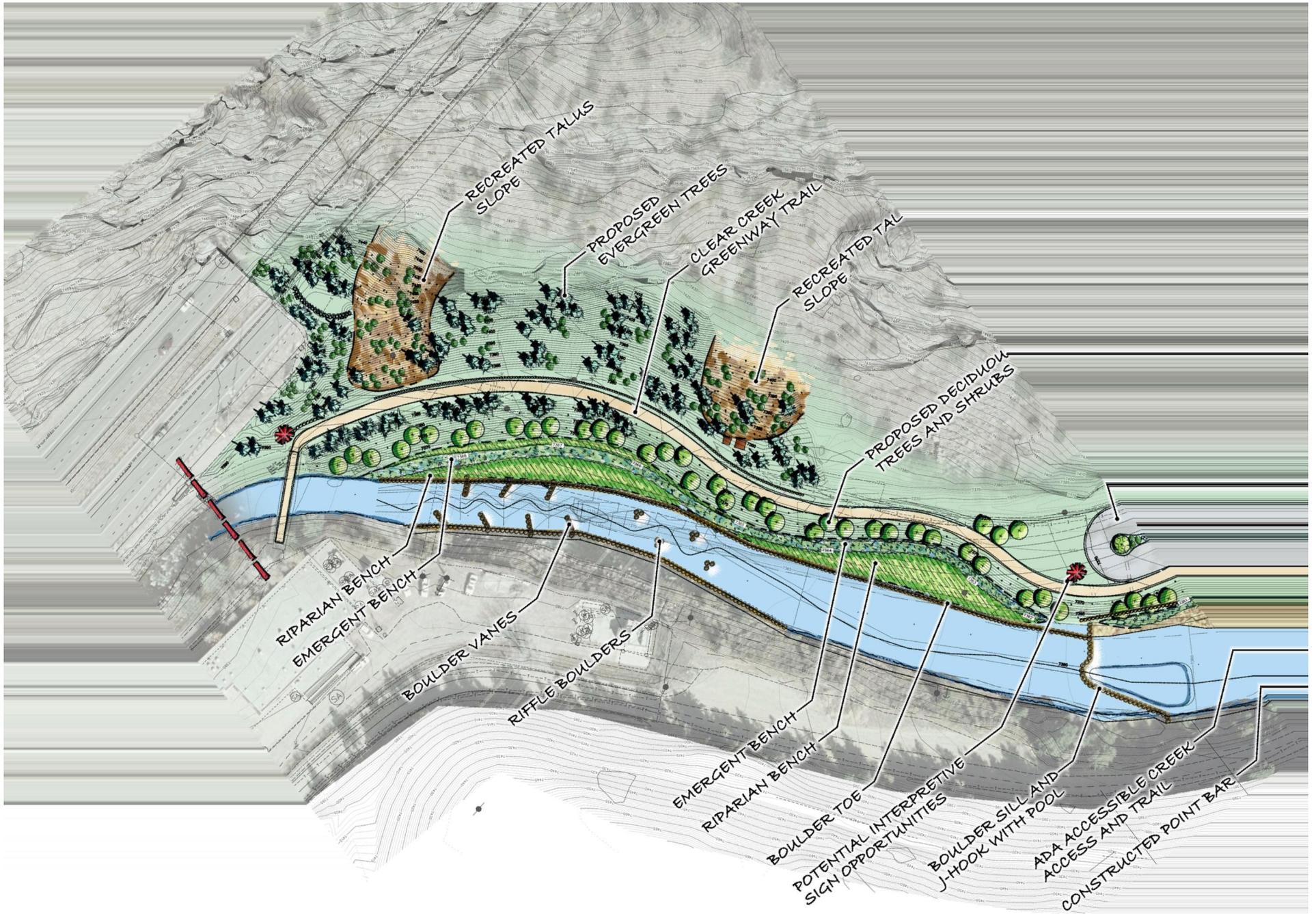


Trailhead: Concept Plan

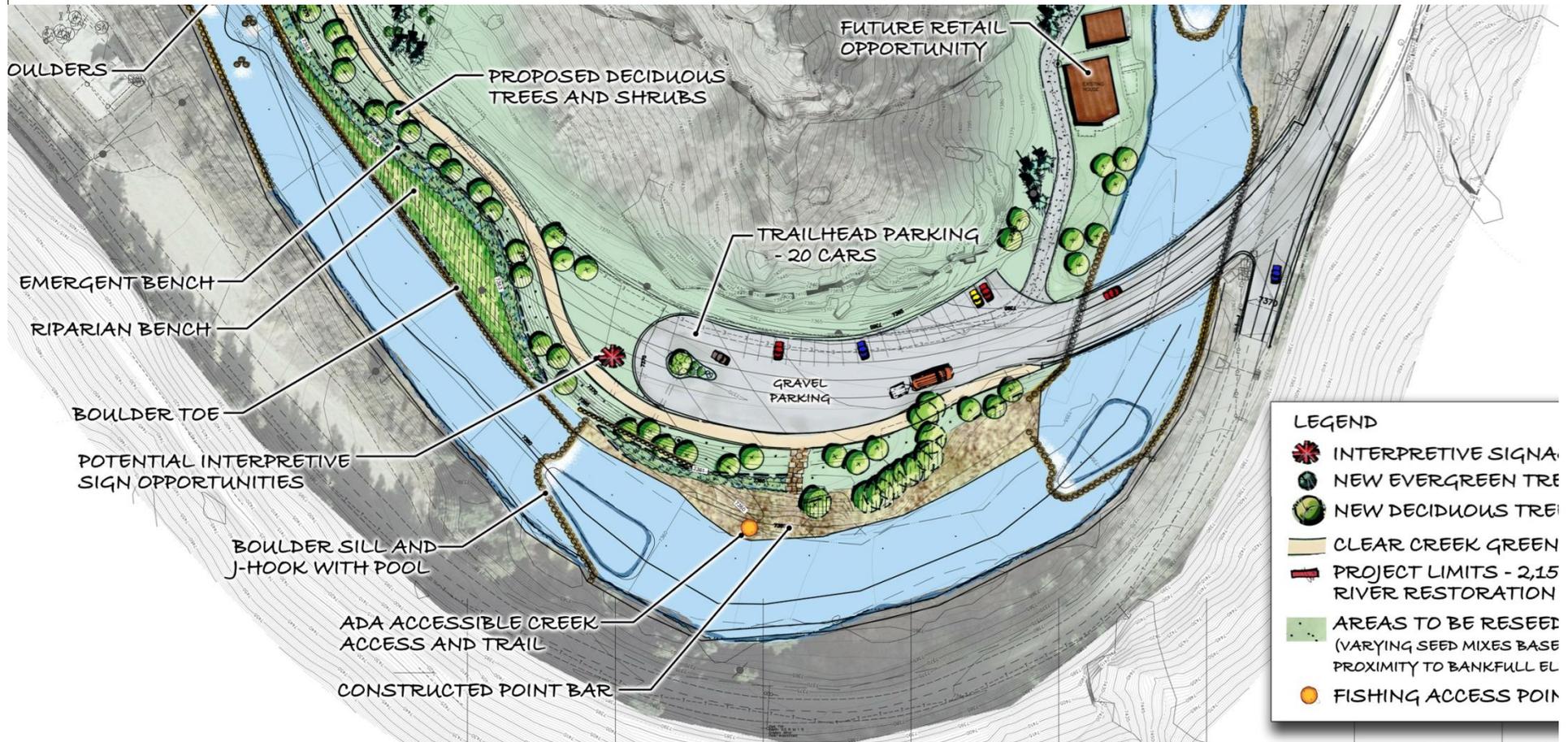


OLD GAME CHECK STATION TRAILHEAD AND RIVER RESTORATION - CONCEPTUAL PLAN

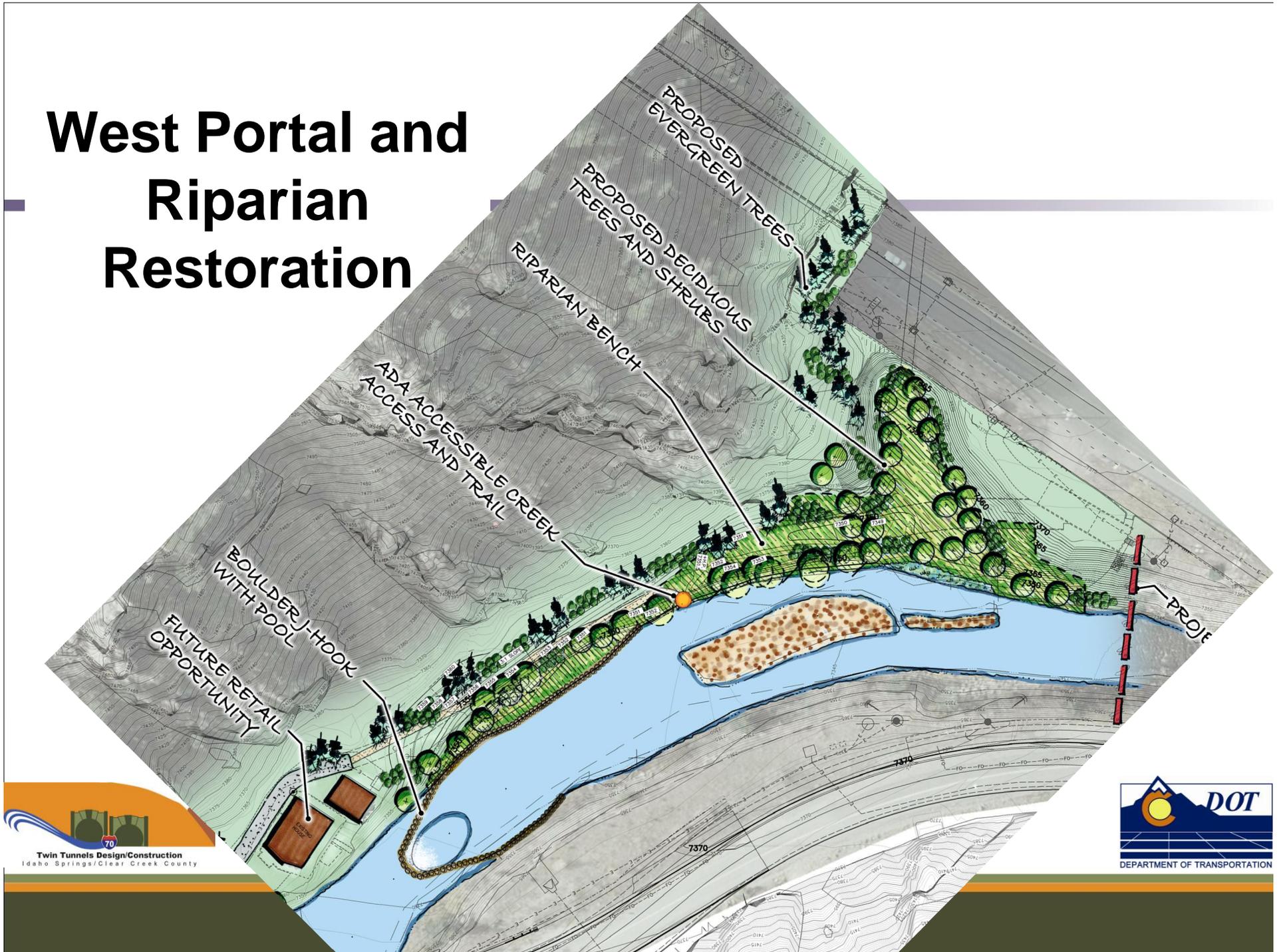




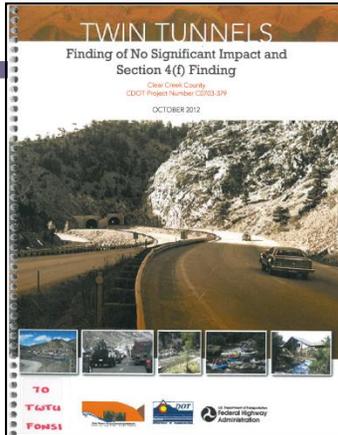
Parking Lot, House and River Access



West Portal and Riparian Restoration



Air Quality Monitoring Plan Objectives



“CDOT’s approach will be to begin the process to acquire the needed technical equipment as soon as possible, and to ensure that it is installed and operational prior to the first blasting activity. Since the purpose of the monitoring is to facilitate adaptive mitigation during blasting activities, the monitoring program will end once the blasting phase is completed. “

I-70 Twin Tunnels Environmental Assessment Air Quality Technical Memorandum, April 2011

Map of monitor locations (red symbols)



Preparation for PM10 Monitoring



Quality Assurance Project Plan
PM10 Monitoring Program
Prepared for:
Colorado Department of Transportation

PREPARED BY:
ADVANCED MONITORING METHODS, LLC
October 2012

Appendix to PM10 Monitoring Plan:



A Listing of Dust Control BMPs for Air Quality Alert Evaluation Form

BMPs listed by Construction Activity

AIR QUALITY ALERT EVALUATION FORM

Field Alert Representative (Print): _____
 Date & Time Alert Received: _____ Is Dust Event Visible? Yes No (circle one)
 Field Rep's Site Location at Time of Alert: _____
 Alert from? Upwind West Monitor or Downwind Hidden Valley Monitor (circle one)
 Reported Monitor PM10 Reading: _____ Monitor wind reading if available: _____

For each question below, circle the box or boxes to the right that best fit your best estimate. If the question requires a check circle answer, use the space provided to give details. If additional space needed use back of form.

Evaluation of On-site Air Alert Conditions

| | | | | | | |
|---|---------------|-----------|----------------------------------|-----------------------|-----------------------|-------|
| Estimated wind speed (circle all appropriate descriptors) | Blizzard | Gusty | Strong Winds | Soft breeze | Like breeze | Calm |
| Locate likely source of dust event | Tunnel Portal | Haul road | Oversee Road or off road machine | Storage of Stockpiles | Non-tunnel Excavation | Other |

Describe current or recent activities on site that may be contributing to dust alert:

Selection of dust control BMP

Is this an active construction activity that can be stopped immediately? Yes No
 If Yes, then stop the activity and assess BMP for deployment.
 Is this a construction activity that has already stopped? Yes No
 If Yes, hold further activity, and assess BMP for deployment.
 Does this activity involve unpaved roadway? Paved roadway or access? Paved Unpaved
 If unpaved, determine dust control BMP – watering, stabilizer, or reduce speeds.
 Does this activity involve active grading or excavation? Yes No
 If paved, determine dust control BMP – sweeping, lowering speed limit, clean up gravel entry ways, other.
 If Yes, select BMP from APTN plan for disturbed surface areas on site (circle all BMPs deployed):
 Briefly explain rationale for BMP selection:
 Watering, increased watering
 Application of Chemical stabilizer
 Equipment speed control, haul road speed control
 Tackifier application to disturbed surfaces
 Compaction of soil
 Wind breaks, silt fence, etc.
 Other: _____

do not fully disclose all requirements.

January 2013

- Interagency consultation among air quality regulatory agencies to establish PM10 monitoring parameters
- Preparation of a Quality Assurance Project Plan to map out technical issues and quality control during monitoring
- Establish an automated pre-violation “alert” procedure for field and technical staff to proactively assess high PM10 events and implement dust control measures
- List of air quality related Dust Control BMPs available to deploy during an alert
- Site logistics



PM10 Monitoring and Alert System

- The National Ambient Air Quality Standard (NAAQS) for PM10 is a 24-hour averaged concentration threshold of $150 \mu\text{g}/\text{m}^3$; not to be exceeded more than once per year on average over 3 years.
- Hourly PM10 concentrations are recorded at each station 24/7.
- Weather data is captured to identify high wind events and general data collection conditions.
- A precautionary “alert” reading was established by CDPHE-Air Pollution Control Division monitoring experts as any PM10 concentration of $135 \mu\text{g}/\text{m}^3$ or more, recorded as an 8-hour running average.
- The “alert” is automated to send an immediate text notification to on-site construction personnel, CDPHE and CDOT air quality staff if this threshold is exceeded at any monitor. Dust sources would then be assessed in the field and suppression BMPs would then be deployed as practicable.



PM10 Monitoring Stations



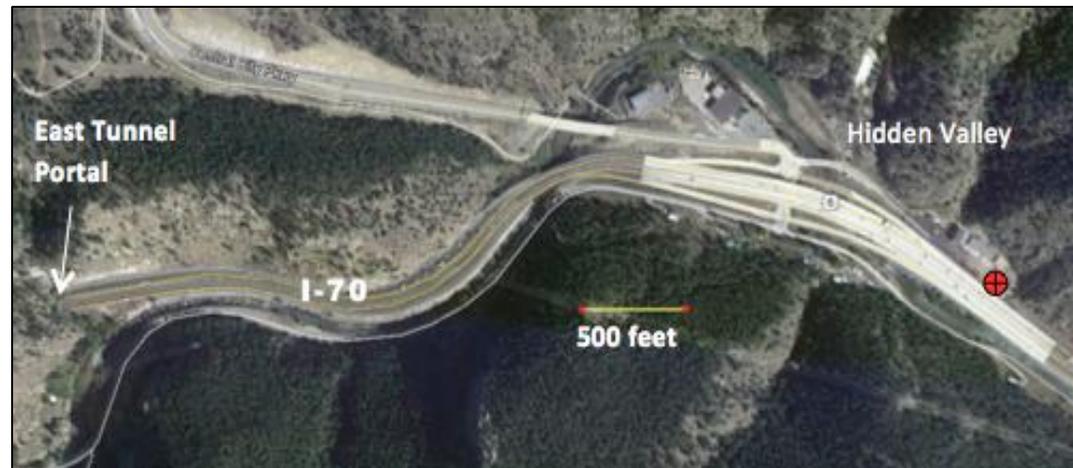
Upwind Station west of tunnels



Upwind map location



Downwind Station east of tunnels



Downwind map location

PM10 Monitoring Equipment



BAM PM10 Particulate Filter

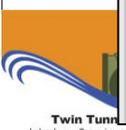
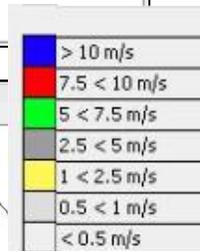
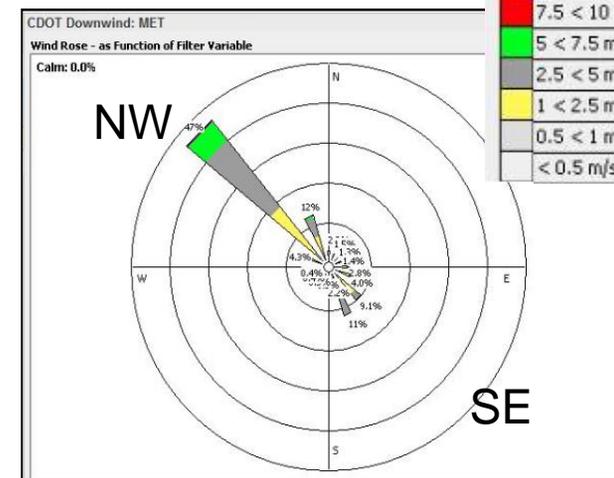
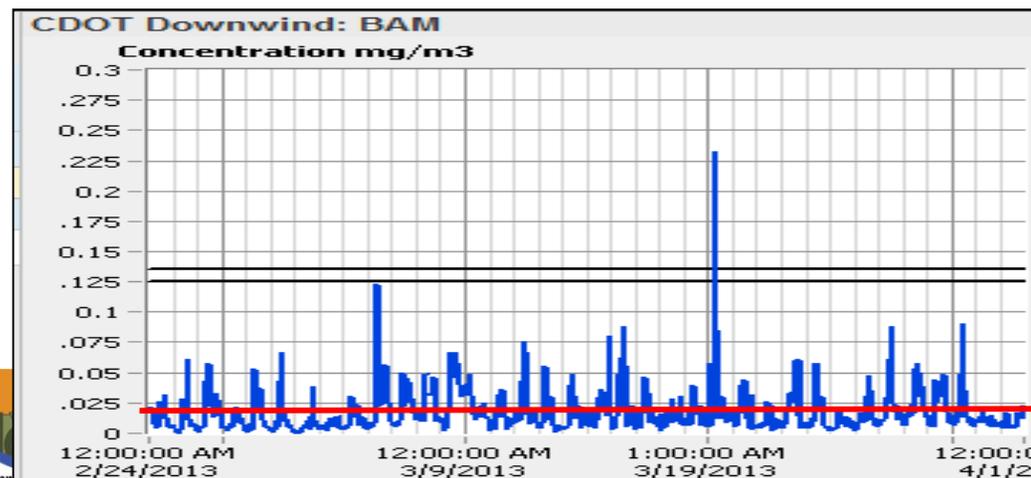
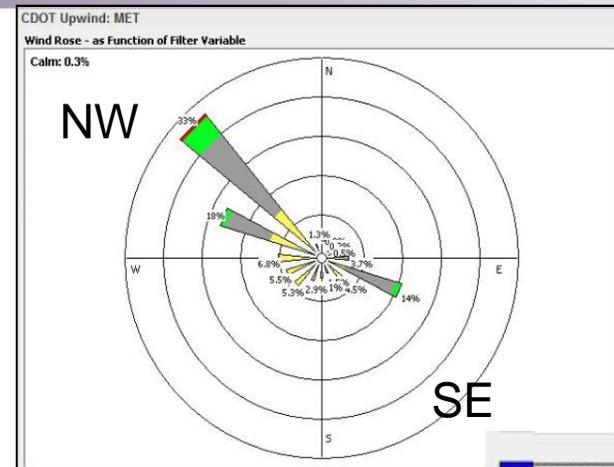
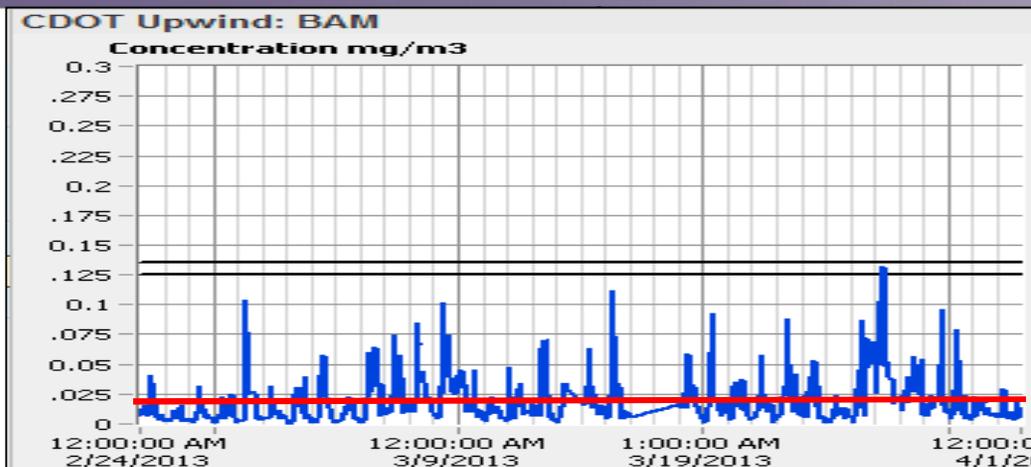


Weather Station & PM10 sensor

Pre-Blasting PM10 Baseline Concentrations

Graphs of PM10 baseline hourly

Wind Rose Diagrams

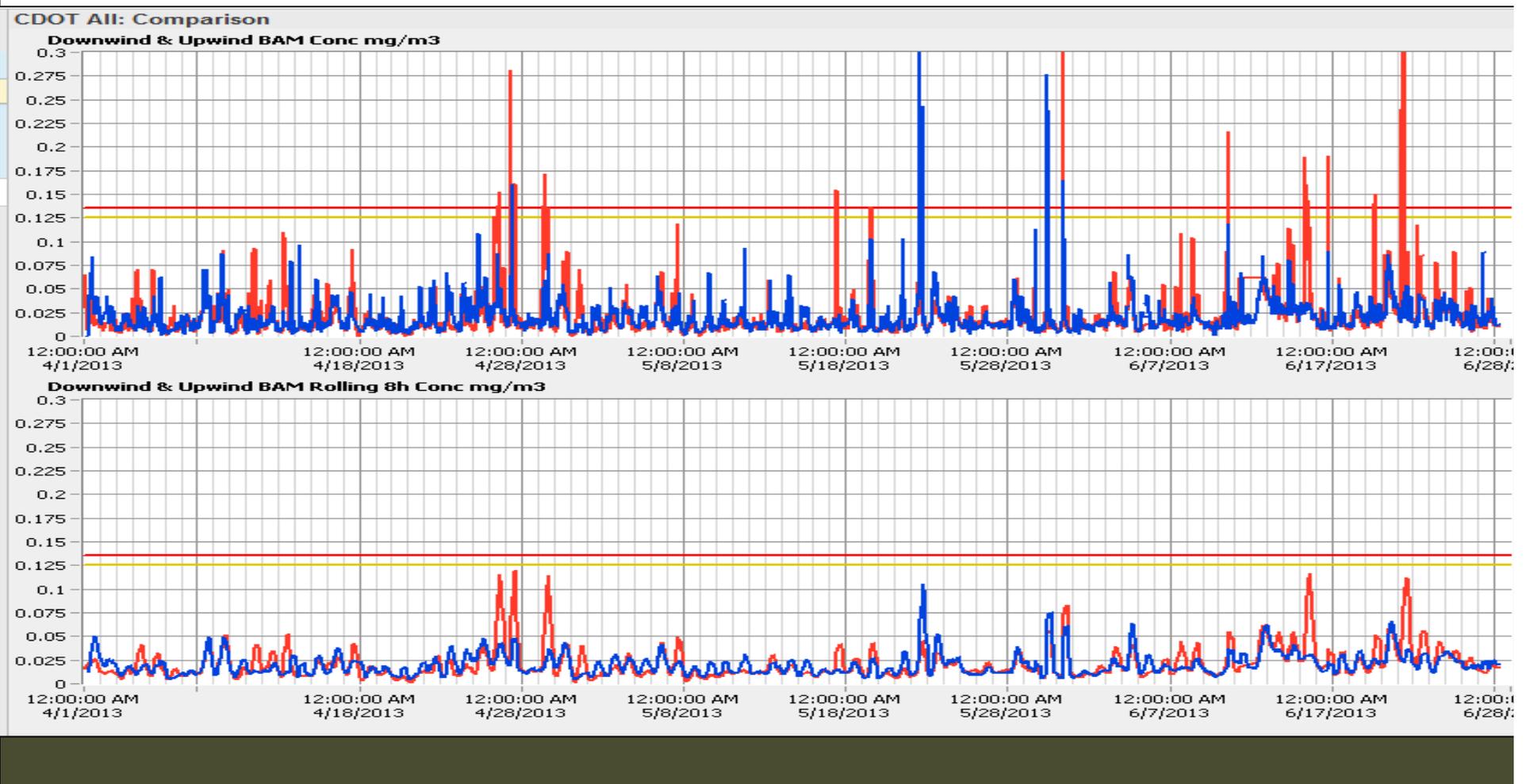


PM10 Data During Blasting & Construction

Graphs of PM10 hourly concentrations from April through June 2013

west station – red east station - blue

- Upper graph shows hourly P10 concentrations
- Lower graph shows 8-hour running average concentrations for “alert” purposes.



PM10 Concentrations Before and After Blasting in June

| Blasting Date | Time Start | Pre-B Blasting Upwind Conc. ($\mu\text{g}/\text{m}^3$) | Pre-B Blasting Downwind Conc. ($\mu\text{g}/\text{m}^3$) | Time End | Post-B Blasting Upwind Conc. ($\mu\text{g}/\text{m}^3$) | Post-B Blasting Downwind Conc. ($\mu\text{g}/\text{m}^3$) | Blasting PM10 Increase ($\mu\text{g}/\text{m}^3$) |
|---------------|------------|--|--|----------|---|---|---|
| 6/26/2013 | 14:00 | 11 | 23 | 14:11 | 13 | 17 | 2 |
| 6/26/2013 | 9:00 | 13 | 88 | 9:30 | 10 | 1 | 0 |
| 6/25/2013 | 8:00 | 38 | 20 | 8:14 | 23 | 27 | 7 |
| 6/24/2013 | 3:00 | 25 | 27 | 3:30 | 29 | 34 | 7 |
| 6/21/2013 | 19:00 | 20 | 17 | 19:30 | 23 | 19 | 3 |
| 6/20/2013 | 14:00 | 91 | 69 | 14:16 | 55 | 76 | 7 |
| 6/19/2013 | 11:00 | 39 | 42 | 11:30 | 19 | 33 | 0 |
| 6/18/2013 | 21:00 | 14 | 20 | 21:30 | 15 | 16 | 1 |
| 6/14/2013 | 19:00 | 29 | 33 | 19:30 | 32 | 26 | 3 |
| 6/13/2013 | 12:00 | 65 | 32 | 12:14 | 43 | 24 | 0 |
| 6/10/2013 | 12:00 | 36 | 26 | 12:16 | 10 | 12 | 0 |
| 6/8/2013 | 17:00 | 38 | 17 | 17:08 | 22 | 22 | 5 |
| 6/7/2013 | 19:55 | 19 | 12 | 20:27 | 25 | 19 | 7 |
| 6/6/2013 | 15:45 | 38 | 17 | 15:54 | 55 | 17 | 17 |
| 6/5/2013 | 20:30 | 12 | 23 | 21:03 | 12 | 9 | 0 |
| 6/4/2013 | 14:30 | 38 | 60 | 14:39 | 60 | 64 | 22 |
| 6/3/2013 | 14:30 | 33 | 17 | 15:01 | 68 | 19 | 35 |

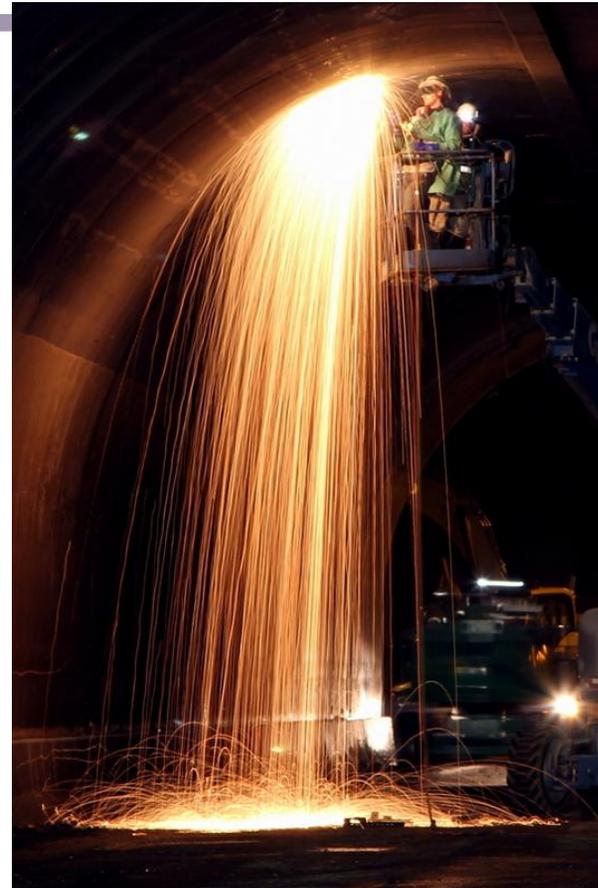
Recap Results of PM10 Monitoring

- Baseline PM10 concentrations averaged $18 \mu\text{g}/\text{m}^3$ between both stations; 12% of the $150 \mu\text{g}/\text{m}^3$ NAAQS.
- There have been no “alerts” of the $135 \mu\text{g}/\text{m}^3$ 8-hour average threshold since monitoring began.
- High hourly PM10 concentrations are associated with short term (1 hour) construction activities dominated by crushing & screening operations.
- High winds affect PM10 levels.
- High concentration increases are NOT associated with ongoing tunnel portal blasting or early rockfall mitigation blasting.
- There have been no exceedances of the EPA’s $150 \mu\text{g}/\text{m}^3$ NAAQS since monitoring began.



Next Steps for PM10 Monitoring Program

- Monitoring will continue until tunnel blasting is completed in August 2013.
- Both stations will then be decommissioned and removed.
- Public access to data will be through EPA's AirData website at <http://www.epa.gov/airdata/>
- A final report and database will be generated for CDPHE's Air Pollution Control Division in compliance with regulations.



Blasting Monitoring

- Vibration
 - » Threshold of 2 inches per second
 - » Vibrations are far below threshold
 - » No damage or complaints
- Air Overpressure
 - » Threshold is 133 dB
 - » Identified some readings higher than expected
 - » Developed and implemented additional mitigation
 - » No damage or complaints



Roadway and Lane Closure Strategy

- EA identified lane closure prohibitions during “peak periods” identified as westbound Friday afternoon and Saturday morning and eastbound Sunday afternoon.
- Project-specific Roadway and Lane Closure Strategy** further quantified “peaks” based on historic November 2010 through October 2011 traffic counts
- Each month has its own strategy. July example shown here.

Month: July

Summary of Traffic Disruptions - Prohibited Times Twin Tunnels Construction

Based on monthly averages (November 2010 through October 2011)

Prohibited Times for Road or Lane Closures

| Single Lane Inside Tunnel | | (1,100 vph) | | | |
|---------------------------|----------------------|-------------|-----------|-----------|--|
| | Weekdays (Mon-Thurs) | Friday | Saturday | Sunday | |
| EB | 8am - 7pm | 9am - 8pm | 9am - 9pm | 8am - 9pm | |
| WB | 7am - 6pm | 7am - 9pm | 6am - 7pm | 7am - 6pm | |

| Single Lane Outside of Tunnel | | (1,600 vph) | | | |
|-------------------------------|----------------------|-------------|------------|-----------|--|
| | Weekdays (Mon-Thurs) | Friday | Saturday | Sunday | |
| EB | 11am - 6pm | 11am - 7pm | 10am - 7pm | 9am - 9pm | |
| WB | 9am - 12pm | 8am - 8pm | 7am - 5pm | 8am - 6pm | |

| Two-Way Traffic in Eastbound Bore | | (1,100 vph - each direction) | | | |
|-----------------------------------|----------------------|------------------------------|-----------|-----------|--|
| | Weekdays (Mon-Thurs) | Friday | Saturday | Sunday | |
| | 7am - 6pm | 7am - 9pm | 6am - 9pm | 7am - 9pm | |

| Full Road Closure for Blasting | | | | |
|---|----------------------|-----------------|-----------------|-----------------|
| Notes: Clearance within 1 hour of reopening time. Closures: 15 min EB / 30 min WB | | | | |
| | Weekdays (Mon-Thurs) | Friday | Saturday | Sunday |
| Times | no restrictions | 9am - 8pm | 7am - 6pm | 8:30am - 8pm |
| EB max queue | | | 6.3 mi | 1.6 mi |
| WB max queue | | 6.1 mi / 4.6 mi | 7.0 mi / 5.4 mi | 5.4 mi / 4.1 mi |



Stormwater Managment

May 23 CDPHE Audit

- Formal inspection of entire site
- 2 minor finding that were corrected immediately
- Inspector noted one of best sites this year
- Requires final letter, but no further action

June 28 EPA Visit

- Two EPA officials visited the site
 - Andrew Gaydosh, Office of Enforcement, Compliance and Environmental Justice
 - Natasha Davis, NPDES Enforcement Unit
- CDOT and KOJV briefing in project office and then went on a field trip through the project.
- This was not an official visit but the EPA staff was pleased with the project and zero violations were noted.



Colorado Department
of Public Health
and Environment



Tree and Shrub Replacement

- SB40
 - » 65 trees removed
 - » Replacing with 90 trees
 - » 36 1" caliper deciduous
 - » 54 10' Cottonwood Pole
 - » Shrubs: 200 for the east portal
- Non-SB40
 - » 104 trees removed
 - » 67 from mountainside, 25 under power lines, 12 at access road
 - » Replace with 159 trees
 - » 149 trees – 6' ball and burlap
 - » 10 trees – 10' ball and burlap
 - » Shrubs: 105 for the trailhead and 50 for the west portal are enhancements



CSS Step 6: Process Evaluation Decision

- Opportunities for Step 6 – Evaluation
 - » Design process evaluation survey
 - Distribute to Technical Team October 1, 2013
 - Collected October 11, 2013
 - Discuss results at (rescheduled) Technical Team October 24, 2013
 - » Construction process evaluation to follow same steps late summer 2014
 - » Evaluation results will be added to the CSS Process Evaluation Document

Step 6
Finalize Documentation and
Evaluation Process



Next Steps

- Recap Action Items from Today's Discussion
- Upcoming project meetings
 - » Ongoing trailhead partnership meetings
 - » Package 3 FOR – August 28, 2013 (distributed mid-August)
 - » Twin Tunnels Technical Team Meetings
 - October 24 - design process evaluation (last 2013 meeting)
 - 2014 Tentative Schedule
 - March – update on stream and trailhead work
 - Mid summer – project progress update (if needed)
 - Late summer – construction process evaluation



END OF PRESENTATION

